

Carbon-Based Coatings on Nanofabric by Using HIPIMS for Possible EAOPs Applications

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Abstract

Nanofibers, capable of providing extra functions in contrast to regular-size fibers due to vary high specific surface area. This has brought a large opportunity for the nanofibers to utilize in form of nanofibrous membranes as air and water filtration materials. In combination with advanced coating technique such as high power impulse magnetron sputtering (HIPIMS), it would be able to develop new form of filtration materials for better purifying performance. In this study, carbon-based coatings were deposited on nanofibrous membranes by using HIPIMS (where high density plasma favorites sp³-containing carbon film growth at low-temperature) to achieve additional functions for use as membrane electrode of an electrochemical advanced oxidation processes (EAOPs). Experimental results show that mixed sp²/sp³ carbon film can be obtained, through the result of Raman spectroscopy analysis. The deposited nanofibrous membrane can be electrical conductive for EAOPs purpose. Degradation efficacy for specific organic substance can vary depending on the deposition parameters and were discussed.

Keywords:

carbon-based coatings, nanofabric, HIPIMS, EAOPs, degradation efficacy